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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

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FINAL REPORT

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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

RECORD-PRESS TENDER 556.885

S-46

TM 001 244

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Pennsylvania State Employment Service

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STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY
FOR
RECORD-PRESS TENDER 556,885

Summary

The General Aptitude Test Battery, B-1001, was administered to a sample of 50 Record Pressmen, 38 men and 12 women, employed by Capitol Records, Scranton, Pennsylvania. Production records were used for the criterion. On the basis of mean scores, standard deviations, correlations with the criterion and job analysis data, Aptitudes P-Form Perception and M-Manual Dexterity were selected for inclusion in the test norms.

GATB Norms for Record-Press Tender 556,885 S-46

Table I shows, for B-1001 and B-1002, the minimum acceptable scores for each aptitude included in the test norms for Record-Press Tender 556,885.

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for S-46

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
P	CB-1-A CB-1-L	90	P	Part 5 Part 7	90
M	CB-1-M CB-1-N	105	M	Part 9 Part 10	105

Effectiveness of Norms

The data in Table IV indicate that 10 of the 18 poor workers, or 56% of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 56% of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 27 of the 35 workers who made qualifying test scores, or 77%, were good workers.

TECHNICAL REPORT

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Record Press-Tender 556.885.

II. Sample

The GATB, B-1001, was administered to fifty (50) Record Pressmen employed by Capitol Records in Scranton, Pennsylvania on the following dates:

7/27/51	11/18/52
11/13/51	11/19/52
2/12/52	11/26/52
11/17/52	3/9 to 3/18/53

Twelve (12) of the sample are women, 38 are men.

The testing was conducted over an extended period of time. Some of the people tested consisted of those who had been laid off due to lack of seniority during slow periods at the plant. Since criterion data were available for 11 of these people they were included in the sample. The remainder of the sample consisted of 39 employed workers.

The job of Record-Press Tender - is known in the Capitol Records Plant as Air Press Operator or Toggle Press Operator.

The training period usually takes 45 days, but the worker is kept in training until he is certified by a Line Supervisor as capable of operating the automatic press on a repetitive basis.

Applicants for the job must submit a complete job application and have a face to face interview with the Personnel Director or one of his assistants. They must pass a physical examination administered by the company doctor. Eight to twelve years of education are preferred and a height of approximately 5' 8" and weight of 150 lbs. are desired. The Wonderlic Paper and Pencil Test and Minnesota Bolt and Nut Dexterity Test are administered to applicants.

Table II shows the means, standard deviations, ranges, Pearson product-moment correlations with criterion and the standard errors of correlation for age, education and experience.

TABLE II

Means (M), Standard Deviations (σ), Ranges, Pearson Product-Moment Correlations with the Criterion (r) and the Standard Errors of Correlation (σ_r) for Age, Education and Experience

N = 50

	M	σ	Range	r	σ_r
Age (years)	30.980	6.801	21-54	-.203	.136
Education (years)	10.040	1.777	7-12	.207	.135
Experience (months)	57.180	41.342	2-144	.071	.141

There are no significant correlations between age, education, or experience and the criterion. The sample does not appear to be particularly homogeneous with respect to any of these variables.

III. Job Description

Job Title: Record-Press Tender 556.885

Job Summary - Operates a power press to mold phonograph records from shellac compounds.

Work Performed

Positions materials and starts press. Positions bottom label with left hand and loads plastic disc in matrix of mold with both hands. Positions top label with left hand, visually checks temperature gauge, and trips levers with both hands to compress materials under great pressure to form materials to shape of mold. Operates small press on a repetitive non-automatic cycle requiring attention to maintain standard quality.

Removes and trims pressed record. Manipulates controls to open mold sections, after specified time interval, to remove molded record. Removes record from die with both hands, pulls off excess plastic with right hand. Reports to supervisor variations in pressed records or trimming quality.

Inspects records. Visually inspects each record for common visible defects such as scratches, obvious stains, bad labels, warpage, deformed center holes, etc., due to deficiencies of stampers, compound or general process. Keeps stampers, compound and steam table properly clean to assure adequate quality. Removes foreign matter from stamper with scraper. Places record on spindle and inserts spacer through the spindle on top of record.

Processes supplies and keeps clerical records. Removes the plastic residue from steam table with metal scraper. Loads plastic discs on steam table to insure constant availability of sufficiently pliable discs for next loading. Maintains records of quality and quantity such as job tickets, daily time record, etc. Moves spindle of records weighing up to 35 lbs. from table to floor approximately 20 times daily.

IV. Experimental Battery

All of the tests of the GATB, B-1001, were administered to the sample group.

V. Criterion

The criterion used in this study consists of production averages for sixteen weeks. During this period the Pressmen worked on five types of records. In order to compare net production on these types, it was necessary to convert the production level to a comparable standard.

According to the officials of the company, the net production level which should be maintained by a worker for a satisfactory level of production is as follows:

7" - 45 RPM Records	130	per hour
10" - 78 RPM (non flex)	100	" "
10" - 78 RPM (semi-flex)	100	" "
10" - 33 1/3 RPM (L.P.)	65	" "
12" - 33 1/3 RPM (L.P.)	45	" "

Since the records of production for the weeks of January, 9th, 1953 through April 24th, 1953, are in terms of the total number of records produced (minus rejects) on all types of records, the percent of standard was computed. These figures could then be averaged over the 16 week period and for all types of records. These production averages were used as the criterion.

Production figures were not available for all of the 16 weeks as some of the workers did not press constantly and some workers had less than 16 weeks of experience. However, it was felt that the averages based on less than 16 weeks could be used since all of the workers had finished training and had been certified by the Line Supervisor as capable of operating the Automatic Press on a repetitive basis and they had sufficient experience on the machines.

VI. Statistical and Qualitative Analysis

Table III shows means, standard deviations, Pearson product-moment correlations with the criterion and standard errors of correlation for the aptitudes of the GATB.

The means and standard deviations of the aptitudes are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), Pearson Product-Moment Correlations with the Criterion (r) and Standard Errors of Correlation (σ_r) for the Aptitudes of the GATB

Record Press: Tender553.885
N = 50

Aptitudes	M	σ	r	σ_r
G-Intelligence	98.040	16.679	.264	.132
V-Verbal Aptitude	92.420	13.498	.113	.140
N-Numerical Aptitude	98.740	20.782	.325	.126
S-Spatial Aptitude	101.680	20.097	.286	.130
P-Form Perception	103.120	16.003	.358	.123
Q-Clerical Perception	97.040	13.516	.193	.136
A-Aiming	103.460	17.667	.246	.133
T-Motor Speed	101.940	15.287	.148	.138
F-Finger Dexterity	109.100	22.724	.278	.130
M-Manual Dexterity	120.940	17.834	.060	.141

The job analysis indicated that the following aptitudes measured by the General Aptitude Test Battery appeared to be important for this occupation:

Form Perception (P) - required in the visual inspection of records for defects.

Manual Dexterity (M) - required to position labels and place materials on press and operate press.

The highest mean scores, in order of magnitude, were obtained for Aptitudes M, F, A, and P, respectively. All of the aptitudes with the exception of F, S, and N have standard deviations of less than 20.

When N = 50, correlations of .361 and .279 are significant at the 1% level and 5% level, respectively. Aptitudes N, S and P correlate significantly with the criterion at the 5% level of confidence.

On the basis of job analysis data, mean score, and significant correlation with the criterion, Aptitude P was included in the test norms. On the basis of importance for successful performance of the duties of this occupation as indicated by the job analysis data and the highest mean score of the sample, Aptitude M was included in the test norms.

Although Aptitude F has a relatively high mean score and its correlation with the criterion approaches significance at the 5% level, its importance is not apparent in the description of the duties of Record Pressman and, in addition, Aptitude F tends to lower the selective efficiency of norms consisting of Aptitudes P and M. Therefore, Aptitude F was not included in the final norms.

The minimum scores were set at one sigma below the means and rounded to the adjacent five point score levels which yielded the best selective efficiency for the norms. This resulted in critical scores of 90 and 105 for Aptitudes P and M, respectively.

For the purpose of computing the tetrachoric correlation coefficient and Chi Square, the criterion was dichotomized so that those who received an average production figure of 100 or more were placed in the high criterion group, and those who received an average production figure of 99 or less were placed in the low criterion group. Table IV shows the relationship between test norms consisting of Aptitudes P and M with critical scores of 90 and 105 respectively and the dichotomized criterion for Record Press Tender . Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

Relationship Between Test Norms Consisting of Aptitudes P and M With Critical Scores of 90 and 105, Respectively and the Criterion for Record-Press, Tender 556.885.

N = 50

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	5	27	32
Poor Workers	10	8	18
Total	15	35	50

r_{tet} = .64 X^2 = 6.948

$\sigma_{r_{tet}}$ = .24 P/2 < .005

The data in the above table indicate a significant relationship between the norms and the criterion for this sample.

VII. Conclusions

On the basis of job analysis data, mean scores, correlations with the criterion and their combined predictive efficiency, Aptitudes P and M with minimum scores of 90 and 105, respectively, are recommended as norms for the occupation of Record Press Tender . The same norms are applicable to the Separate-Answer-Sheet Form of the GATB, B-1002.